WESTERN UPDATE #68

THE WESTERN NEWSLETTER FOR MF, LF, AND VLF EXPERIMENTERS

Available for business-size 25 cent SASE's, plus 60 cents per issue (or $7 per year)
from: Jim Ericson, 226 Charles St., Sunnyvale, CA 94086-6063

ACTIVE WESTERN BEACON STATUS (LIST COMPILED OCTOBER 29, 1989)

FREQ(kHz)	IDENT	QTH	SKED INFO
163.80	FPV	Granada Hills, CA	Weekends. See alt. freq. 182.62 kHz.
166.503	C	near Morro Bay, CA	24h/7d. Hot!
169.96	NRE	San Diego, CA	24h/7d.
171.139	**K**	**Mountain View, CA**	**24h/7d. Scott Mawhinney.**
175.225	MAX	Wheatland, WY	24h/7d CW. BPSK/ASCII by request.
175.703	FAW	Orem, UT	24h/7d.
176.26	CO	Glenwood Springs, CO	24h/7d.
176.75	SR	Elgin, OR	Status unknown.
176.85	7FS	Belfair, WA	24h/7d.
177.75	CT	Pleasant Gap, PA	10 baud BPSK. Status unknown.
179.0	MPM	Salt Lake City, UT	24h/7d. ASCII/CW alternating 5minutes.
179.54	WJ	Arleta, CA	On, but intermittent.
180.224	F	Los Banos, CA	FSK. By request.
180.80	XU	Sioux Falls, SD	24h/7d. BPSK/CW alternating 5 minutes.
181.17	IZJ	San Gabriel, CA	Daily. Silent 0700 to 1100 UTC.
182.62	FPV	Granada Hills, CA	Weekends See alt. freq. 163.80 kHz.
182.672	G	Palo Alto, CA	24h/7d.
182.88	H2	Descanso, CA	24h/7d.
183.160	PRK	Saratoga, CA	24h/7d. K6PRK.
183.544	MEL	San Jose, CA	24h/7d.
183.63	PLI	Burbank, CA	Big signal, but intermittent sked.
183.74	**ZI**	**San Jose, CA**	**24h/7d. Frank Butscher W6SZS.**
184.016	EK	Sunnyvale, CA	24h/7d. (Earthquake-proof!).
184.383	TI	Kingman, AZ	24h/7d.
184.39	HO	Pahoa, HI	By request.
184.43	V	Forestville, CA	24h/7d. Weak, but on the air!
184.46	B	Fresno, CA	24h/7d.
185.0	ZYK	Redway, CA	24h/7d.
186.80	BA	Lancaster, IL	24h/7d.
187.0	ELU	Simi Valley, CA	24h/7d. Saturday and Sunday A.M. on SSB.
187.252	TEXAS	NW of Ft. Worth, TX	24h/7d.
187.30	UPN	Cincinatti, OH	Occasional.
187.50	DCH	Berlin, MD	Schedule unknown.
187.59	**SM**	**San Jose, CA**	**Temporarily off.**
187.77	**AZ**	**Tucson, AZ**	**24h/7d. Alt. Freq. = 185.49 kHz.**
190.4	OHH	Richmond Hill, Canada	Occasional testing.
525.+/-.76	T (dashes)	Sunnyvale, CA	A2 mod 24h/7d. Ed Gelinas.
1619.92	D	Salt Lake City, UT	24h/7d morse/FSK. Mark Mallory.
1620.08	U	Salt Lake City, UT	24h/7d morse/FSK. Mark Mallory.
1624.75	CT	Pleasant Gap, PA	24h/7d. 5 baud CCW. Clint Turner.
1650.62	**G4**	**Palo Alto, CA**	**24h/7d. Herb Vanderbeek.**
1650.67	TI	Kingman, AZ	24h/7d. Big signal! Rex Wilson.
1655.5	CO	Glenwood Springs, CO	24h/7d. Bob Cutter.
1661.35	U	San Diego, CA	Nites only.Steve Meyerpeter, KG6BY
1687.28	D	Descanso, CA	6PM to 6AM daily . Frank Cathell.
1688.25	**TUS**	**Tucson, AZ**	**24h/7d. Friend of Greg Farkas, KD7QK.**
1689.1	**AZ**	**Tucson, AZ**	**24h/7d. Greg Farkas.**

8 MORE SASES ON FILE

Non-Western listings are beacons currently being copied in the West, or they have SASE's on file with us. **Bold entries indicate recent changes, or new beacons.**

EK NOTES: As far as we know, all California LowFERS (and their antennas, wives, kids, houses, dogs and cats) survived the Quake of 89! I've lived in California all my life, and have pretty well gotten used to earthquakes. But THIS one scared the hell out of me! Needless to say I am very lucky.

As you can see from page one, MedFER activity is on the increase, and most MedFER beacons are being heard 500 to 1000 miles away! Some LowFERs who were off for the summer are coming back on --- so it should be an interesting fall and winter!

Welcome to you new subscribers! For your benefit, I'll repeat some valuable resource information: The other publication serving low-frequency experimenters is called THE NORTHERN OBSERVER. **Herb Balfour** publishes it from Canada, and it's aimed at midwest, eastern and Canadian experimenters. The deal is $12 per year plus twelve self-addressed (no stamps) business-size envelopes -- from Herb Balfour, 91 Elgin Mills Road West, Richmond Hill, Ontario L4C4M1, Canada. **Ralph Burhans** of Burhans Electronics produces high quality and inexpensive receiving whip and loop amplifiers for experimenters. For a free catalog write him at 161 Grosvenor St., Athens, Ohio 45701. A national publication called THE LOWDOWN gives a monthly rundown of all experimental activity below 500 kHz. It's $12 per year from The Longwave Club of America, 45 Wildflower Road, Levittown, PA 19057.

Some late listening notes (as of October 27th): **Frank Cathell** and **Mike Mideke** are both hearing **G4** fairly well. **TI** is hearing it also. Frank and Mike both hearing **7FS, MPM**, and most everyone except **CO**.

The grapevine says **Steve McGreevy** blew in from Hawaii and checked out Kingman, Arizona. Word has it he may settle for awhile in Santa Rosa. Steve moves so fast the Post Office can't keep up with him! Hello Steve...this is the operator! Where in the world are you???

MAILBAG: **Greg Farkas** writes from Arizona to report that, "MedFER beacon **AZ** is now on 1689.1 kHz with a new antenna and improved signal. Had first reception report from **Frank Cathell** in San Diego. Antenna is 9.5 feet high, 1-5/8 inch diameter vertical with three top radials 4.5 feet long. The base is at 18 feet and fed against an extensive fire sprinkler system at the work QTH." Greg is hearing MedFER **TI**, both **D** and **H2** from San Diego, and recently the **Mark Mallory U/D** pair from Salt Lake City!

Ev Paschal says he is now living full-time on Sinclair Island up in Washington and is getting ready for winter. Ev recently got his ham ticket (his new call is **KF7VX**). He hasn't gotten HF going yet, but is enjoying 2 meters. Ev has a cellular phone on the island, but until early next year when cell sites should be upgraded, he has to make phone calls via Vancouver B.C.

Jim Welch (KK6N) wrote, "Thanks for WU! Just finished an RBL-3 conversion to solid state. Yanked about 50 pounds of iron-cored components and bathtub capacitors out of it. Now one man can carry it, instead of two! Maybe next spring I'll take it with a 12 volt battery out to the boonies where it is quiet."

Bill Hooper has been doing some remote listening at 7000 feet from a site near Truckee, CA using a new 1500 foot wire and a new regenerative preamp/Magnavox receiver/LF Engineering converter/MFJ dual filter. He says, "I am hearing **PRK, EK, MEL, MPM, ZI, and H2**. On the MedFER waves I am hearing **TI and D** (1687.3)." Bill reports hearing variously **AT/TA/T** near 171 kHz. Bill, I think those are all the same Mountain View **K** beacon. The keyer is just a little goofey.

Ron Barlow's MedFER **A** beacon in North Carolina is off the air. Ron writes, "It was repeatedly damaged by a multitude of thunderstorms, depleting my supply of spare IC's! As if I wasn't already overwhelmed with broken and damaged equipment, hurricane Hugo passed through last Friday, delivering hours of punishing 90 mph winds and doing considerable damage. I won't be able to re-activate until late November." Good luck Ron!

Brice Anderson (BA) checked in from Illinois to report, "LF conditions were terrible all summer and fall. Almost constant storms and high QRN. LF is just now (Oct. 6th) coming to life. I was completely wiped out by lightning in August, and had to rebuild the exciter and final. **BA** is back on its usual schedule. I now have about 3000 feet of ground radials down, and plan to put down the remaining radials and two rolls of chicken wire fencing at the base of the vertical. By the way, **Jim Weiss** of LaGrange, IL flew down to the Mt. Carmel airport last week and we had a great visit. He saw my antenna farm and heard the LF band here."

Allan Egleston wrote to suggest we start a column to help people who want to buy and sell used gear. I think that's a good idea, Allan! Why don't you get the ball rolling by sending me a list of gear you are looking for? I'll publish it in the next issue.

Dave Stinson (R) surfaced after being out of LowFER action for several months. Turns out he moved to Pahrump, NV with his new wife and bought 12 acres of desert. The spring winds blew down his **R** beacon and it has not been rebuilt. With 12 acres, Dave ought to be able to do something pretty outrageous! Let's hear from you, Dave!

Ken Cornell (W2IMB), author of The Low and Medium Frequency Scrapbook, wrote saying he received a letter from a fellow in Puerto Rico who had his radio shack completely wiped out by hurricane Hugo. All of his equipment was completely destroyed. Ken says he is not looking for handouts, but is interested in obtaining used communications receivers and test equipment. Ken requests, "If any of your readers have used gear, I would appreciate hearing from them and I will advise **Lorin Schiess** in Puerto Rico. Those who wish to contact Lorin direct can do so at PO Box 870, Vieques, P.R. 00765. Lorin has plans to start a new life in Edinburg, Texas. Thanks for any assistance." Ok, Ken. I've got a couple of goodies in the garage which I'd be happy to donate to Lorin. I'll contact you soon. Anybody else with cheap (or free) good equipment? By the way, Ken Cornell's Scrapbook is another MUST for the LF experimenter. I think the current price is $15. Write to Ken at 225 Baltimore Avenue, Point Pleasant Beach, New Jersey 08742.

George Trinkaus of the HIGH VOLTAGE PRESS (P.O. Box 532, Claremont, CA 91711) wrote to say, "I come to LF radio almost void of knowledge. I know from my Tesla that the low band is more radio-effective. I learned about the LF experimenter band in the catalog of Pan Com." George sent along two fine pamphlets which he has published. One is called Tesla -- The Lost Inventions (33 pages). The other, Tesla Coil (25 pages). Both are extremely well written and illustrated, and cover significant detail of the "suppressed" inventions of Nikola Tesla. I think the price on these is $5.95 each, but check with George if you're interested.

Howard Kraus (K2UD) wrote a letter that made my day (whether the compliments were deserved or not!). He describes Western Update as a "terrific service", and goes on to say, "I will mention that little attention is paid to MF, LF and VLF operations in other publications (save for the LOWDOWN, and the NORTHERN OBSERVER). I have also noticed that knowledge of this type of operation is starting to become more publicized in more radio circles now. As for myself, I am in the 'interest' stage, gaining more information on LowFER operation specifically. The articles in WU I consider to be world-class, and I will attempt to provide future articles for publication." Thank you, Howard! Hope you can get some activity going back there in noisy (but fun!) New York.

SAN JOAQUIN CALIFORNIA LOWFERS HOLD MINI-CONVENTION!

(A news-flash submitted by Dave Johnson 'F')

On October 15th, **Boyd Skillin (B)** of Fresno visited **Dave Johnson (F)** in Los Banos, CA. Dave's homebrew receiver that quit last winter decided to work again for the sake of such a distinguished visitor. So rather than swapping lies and trading schematics, everyone in attendance gathered around the 22 foot unguyed vertical in Dave's front yard while the loading coil was tuned up and the receiver loopstick placed next to it. LowFER beacons **C, K, PRK, and EK** were logged (first time for **C** at this QTH). They marvelled at the 'khoo-khee-khaw' of **GWEN**, the sideband splatter of **COR** (205 kHz), monster TV raster harmonics, and assorted PLC's. In the evening they hauled the **F** beacon with its one-meter square loop antenna over to a friends house a mile away...to see if it could be copied at Dave's QTH. Came in strong, despite plenty of QRN from a tropical storm. The friend discovered on his old boat-anchor Collins that HE was actually the first LowFER in Los Banos -- his intercom came through loud and clear at 185 kHz! The conferees discussed modular receivers, cheap test equipment, portable LowFER beacons, and good projects for people just getting started in electronics. To obtain a copy of the LowFER Conference Proceedings, just Xerox this news item, and presto! You got it!

PROJECT ACTIVE UPDATE
BY: MICHAEL MIDEKE

Despite rumored delays, the ACTIVE satellite package was launched September 28th...on schedule. The launch was successful and initial (undetailed) reports indicate that the spacecraft is doing OK. On October 1st as this report is being prepared, separation of the CZACK sub-satellite lies a few days in the future. No VLF transmissions of ACTIVE over the western hemisphere are expected before December. If all goes well, transmission schedules are expected to continue for at least four months once they do begin, so there is still time for interested experimenters to prepare for monitoring ACTIVE transmissions and possible triggered emissions.

Both NASA and IKI have approved a TRW-sponsored project which will allow 100 or more high school science programs to assist in ACTIVE data collection. They will produce baseband recordings with portable cassette recorders, using a loop receiver kit that TRW will provide at nominal cost. In principle, there appears to be no objection to amateur observers tagging along on the coattails of this program. Enough operations information should be available to enable listeners to monitor the VLF transmission schedules.

In response to SPACE PROJECT ACTIVNYI (See October LOWDOWN and the LF newsletters) Dr. Owen Storey points out that most triggered emissions are likely to appear on the high side of the triggering frequency. This places our band of greatest interest between 9.5 and 13 kHz. Even ignoring the fact that this segment is packed with Omega channels, this is somewhat challenging territory for baseband receivers, ears that have lost their youthful edge, and cassette recorders. It is also an area where conventional superheterodyne receivers and receiver/converter combinations can be used more easily than in the region below 9 kHz. While there are no unsolvable problems presented by the baseband approach, there is certainly no reason to avoid an up-conversion scheme if that seems more practical. Confusion will be avoided if the receiver configuration results in a direct correspondence between input and output frequencies ---an emission of rising frequency should produce a rising frequency in the receiver's output.

(Ed. Note: The following technical information on ACTIVE was forwarded by NASA/TRW on October 11th):

Launch time: 0005 UTC September 28, 1989 (271d).
Launch site: Plesetsk Cosmodrome
Initial perigee: 511 km
Initial apogee: 2497 km
Initial inclination: 82.6 degrees
Initial period: 116 minutes
Altitude at 35 degrees North: 2481 km for v N, 917 km for v S
Separation time: 0430 Central European Time on October 3, 1989
Engineering tests scheduled for one month
Beginning of operations over Western hemisphere: about December.

AK Name: INTERCOSMOS 24
International designator: 1989-080A
NORAD Designator: 20261

MAGION-2 Name: INTERCOSMOS-24
International designator: 1989-080B (rocket body?)
NORAD Designator: INTERCOSMOS 24-20262 (rocket body?)

Other info: LA-35H, 118W(242E), alt=917 km (S), 2481km (N).

By the time this report appears in print, I should be able to provide further details that will be useful or essential to ACTIVE monitoring. Given production schedules and other demands on the LF publications, there can be no guarantee that future updates will be published in time to be of practical value. So if you want to participate in ACTIVE experiments, send me a business-size SASE and a note outlining whatever capabilities and needs seem relevant. My address is: Box 123, San Simeon, CA 93452-0123.

DAYTIME SKYWAVES AT LF AND MF

By Michael Mideke

Here are a few notes in response to Dean Manley's comments on MF daytime skywave (WU #67):

Broadcast band DXers have long been aware that daytime "D" absorption is variable, particularly during winter months. Sometimes absorption in the "D" region is low enough to permit "E" reflection; at other times reflective zones appear to develop in the "D" region itself. Both phenomena can lead to single-hop daytime skywave on the BCB. Similar effects can be observed through the NDB and Lowfer bands, and on down to at least as low as 50 kHz.

On 160 meters I have achieved tenuous daytime copy on 1 watt transmissions at distances beyond 100 miles. Higher powered local daytime communications from the same area have been copied on numerous occasions. All of this reception has shown minute-to-minute and day-to-day variation characteristic of skywave propagation. Due to a lack of data, there has been no attempt to correlate these instances of MF reception with daytime skywave openings on LF.

Considering that the smallest signals to produce marginal 160 meter daytime signals at 100 miles were at least 20 dB stronger (by virtue of 1 watt power and full size antennas) than signal intensities obtainable with Part 15 operation in the 1620-1705 kHz segment, it seems unlikely that reliable daytime skywave will be produced under these conditions. But since we really do not know the possible range of variation for this propagation mode, the chance of daytime Medfer skywave cannot be ruled out. It does seem doubtful that much in the way of useful communication can be expected.

LF is another story though. October 22-26 has marked one of the longest runs of LF daytime skywave that I have seen in over 10 years of monitoring. On the 23rd the NDB band was open to the Northeast to nearly 1800 miles, and a great many NDBs were audible at 1200 to 1500 miles. Lowfers 7FS (800 miles north) and MPM (600 miles NE) were readily copied. The 24th was the big day for Lowfers though; at 10;30 AM, PDT I copied 7FS, MPM, MAX (first MAX copy of season!) and AZ in a 10 minute period. On the 26th TI was added to the list- pretty well accounting for the existing Lowfers between the limits of regular groundwave reception and the limit of single-hop propagation. Checks of the Medfer band failed to produce any skywave beacons.

Not a great deal seems to be known about the LF daytime openings. I have determined that at least on occasion they are quite extensive, covering much of North America. Fading tends to be shallower and slower than nighttime fading. Often daytime skywave exhibits amazing stability- When a phasing unit and two antennas are used to place a deep sharp null on daytime skywaves that null may remain stable for many minutes. At night null stability on the same signal is at best a matter of seconds. This leads to speculation that some manner of high-order waveguide mode or ducting is responsible, at least in some instances.

There are many relatively simple experiments that can be done with LF and MF daytime skywave. It would be very interesting to see if skywave openings on 160 meters correlate with LF daytime openings. A network of relatively high powered daytime beacons on 160m (50 to 100 watts will put down SOME skywave at 100 miles on a majority of winter days) would give us a good picture of the range of daytime variations on these frequencies. Since 160 is largely free of daytime signals, interference to communications would be minimal while interference to beacons would be far less troublesome than on the Medfer band...and infinitely better than attempting to work with existing BCB signals. Operation of this type would require STAs (Special Temporary Authority) from the FCC, so it is not a project that seems worth undertaking without a well defined research program and a thoroughly committed team of participants.

For more on Daytime Skywave see: "Daytime Variations in LF Skywaves" THE LOWDOWN, January, 1988.

IMPROVED KEYER

by: Herb Vanderbeek WY6G

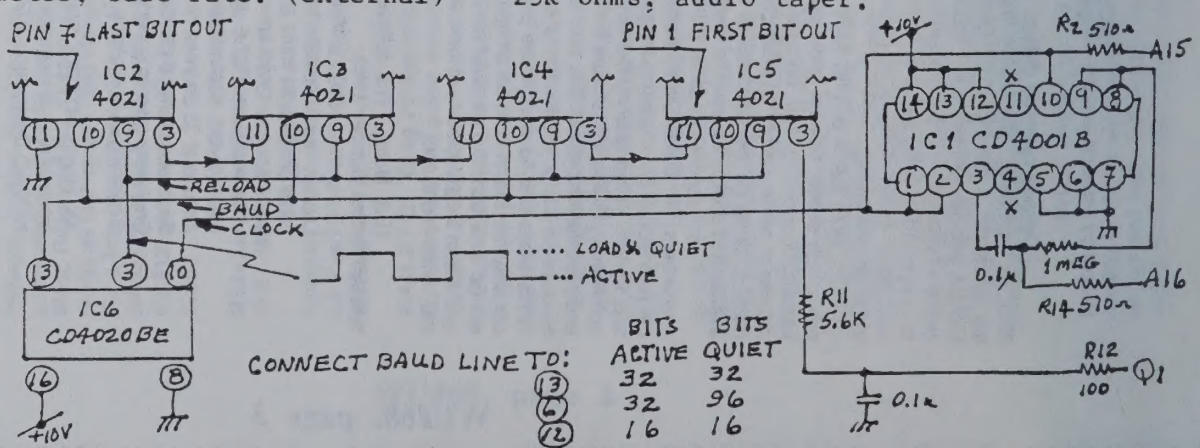
In the May 26 1987 Issue of the Western Update I published an article of an identification keyer "that would not glitch". It is still good and has been duplicated several times. (Ed. note: See reprint of article on pages 5&6).

I have recently used the basic circuit with a MedFER transmitter and reworked several areas of the original keyer design; reduction of materials, ciruit simplification, and improvement of utility.

I have often wished that my ID's could be spaced further apart. In the published circuit this can only be done by increasing the memory and then not using it! I wandered about the land of illogic studying non-programmable shift registers and such with the nagging thought that that was not "right". The solution for improved utility: "why not load the parallel to serial shift registers and then not circulate the data and finally reload at some time after the data had run out of the registers". Simplification & reduction of parts count: removal of nine parts. This is done by: (1) connecting the registers load line to the final output (max count) of the loading controller, pin 3 of a CD4020 (replacing the CD4040), (2) eliminated the load signal pulse formed by R6,7,8, C6 & CR1, (3) replaced the clock oscillator, XR2242, by the much cheaper CD4001 eliminating C11, R3, R4, & R5, (4) connected the output of the CD4001 clock, pin 3, to the CD4020 clock in, pin 10, (5) moved the shift registers clock line to pin 13 of the CD4020. There is some compromise here but it works quite well. I used only two NOR gates of the 4001 tied as inverters and deactivated the other two. This oscillator uses only C1,R1,the same external potentiometer of 25,000 ohms and a 1,000,000 ohm 1/4w resistor. One can retain the CD4040 but I prefer the greater count of the CD4020 because it allows the new clock to operate at the same frequency range as that of the original XR2242 oscillator. Changed areas of schematic are reproduced below.

"CHANGED PARTS LIST"

Prepunched circuit board	RadioShack #276-190 or equal
Wire wrap pin strips 175 pins(5 blocks)	Samtec TSW-136-14-T-S (surplus)
8 pin & 16pin DIP sockets your choice	I use Augat 5xx-AG11D (surplus)
8 switch DIP blocks, your choice	I used R-S 275-1301A
IC-1 Clock Oscillator	CD4001BE
IC-2/3/4/5 Shift Registers.	CD4021BE
IC-6, Divider/Counter	CD4020BE
IC-7 Voltage Regulator 12 volt	MC7812CT
Q-1 General purpose amp/sat-switch	2N3904
CR-2 general purpose diode	1N4148
CR-3 rectifier	1N4001
C-1 Monolithic, stable, CRL 30A104K	0.1 uF @ 50 Volts
C-2/3/4/5,Monolithic, cer, (Mica OK)	220 pF @ 50 volts
C-7 Tantalum, (Lytic OK, add 1uF tant)	100 uF @ 20 volts
C-8 "	1 uF @ 35 volts
C-9/10/11 , ceramic,(disk OK)	0.1 uF @ 50 volts
Resistors,1/4W, carbon film, per schem.	I use new surplus
Potentiometer, baud rate. (external)	25k ohms, audio taper.



REPRINT OF ORIGINAL KEYER ARTICLE FROM WU#45

ID KEYER: by Herb Vanderbeek, WY6G (beacon "G")

What's this! Another beacon ID keyer? Why not!

LOWFER beacons usually employ an identification keyer. This is a description of an all solid state, programmable unit that will not glitch.

The keyer requires external power of 12 to 18 volts at less than 50 milliamperes, not including the relay. The keyer is divided into five sections. The power regulator-MM7812CP with 1uF at input and 100uF at output, clock- XR2242 a special addaptation of the 555 that includes a 128 divider that allows very small timing capacitors, memory-four 8 switch DIP blocks that are converted to serial by CD4021BE shift registers, auto reload-CD4040BE that reloads the shift registers each 32 bits shifted, and relay output rather than a solid state and-gate. I use sockets for the IC's.

* relay voltage can be obtained from prereg supply; R13: calculate /select to set coil voltage; Expand-duplicate IC-4 circuit for added 8 bits or more and you must change C6-R6 to CD4040 pin 2.

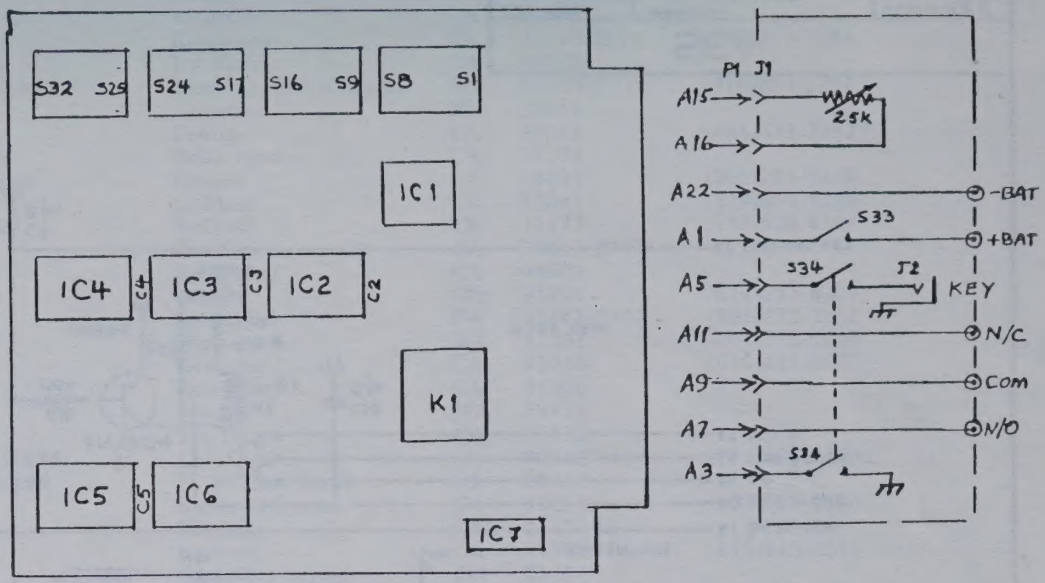
Operation is as follows. Upon turn-on the XR2242 clock will pulse the CD4021BE shift registers and CD4040BE 12 bit binary counter. The CD4040BE after the 32nd pulse pulses the CD4021BEs' parallel/serial control to load the data, "the program" from the parallel switch memory to be output in serial form, "the program". The program is taken off of the last stage of the last shift register, IC2 to the 2N3904 saturated transistor relay driver. I believe that the only specific care that needs to be taken is that the 220pF capacitors shown at pin 11 of CD4021BEs on the schematic must be mounted next to the chip ground pin. Data from the preceding chip pin 3 (Q8) terminates at the capacitor and is daisy-chained to pin 11.

The photograph shows my particular construction. Easy for construction but not cheap. This technique allows quick rewiring, component change, and presents a clean trace side. The PC board I used is available through Radio Shack, Cat #276-190. I removed the board beyond hole location 45.

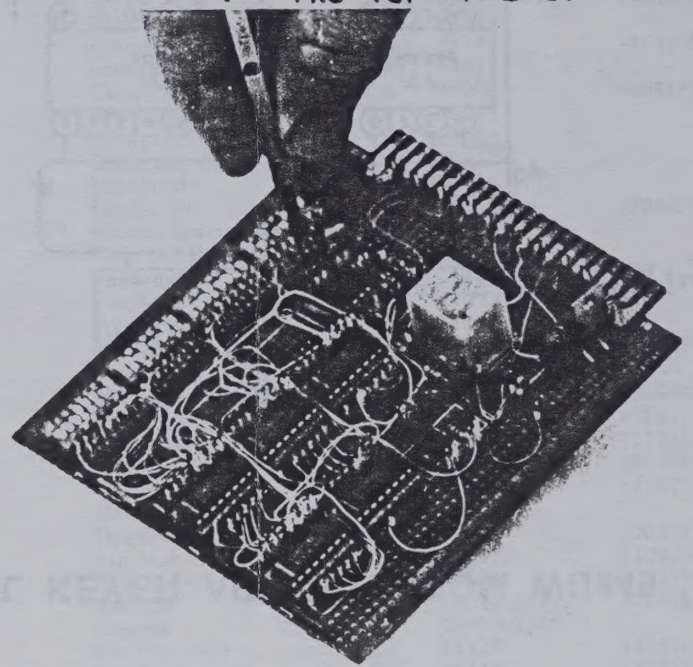
Prepunched circuit board	RadioShack #276-190 or equal
Wire wrap pin strips 175 pins(5 blocks)	Samtec TSW-136-14-T-S (surplus)
8 pin & 16pin DIP sockets your choice	I use Augat 5xx-AG11D (surplus)
8 switch DIP blocks, your choice	I used R-S 275-1301A
IC-1 Clock Oscillator & Div by 128	EXAR XR2242P
IC-2/3/4/5 Shift Registers.	CD4021BE
IC-6, Divider/Counter	CD4040BE
IC-7 Voltage Regulator	LM317T
Q-1 General purpose amp/sat-switch	2N3904
CR-1/2 general purpose diode	1N4148
CR-3 rectifier	1N4001
C-1 Monolithic, stable, CRL 30A104K	0.1 uF @ 50 Volts
C-2/3/4/5,Monolithic, cer, (Mica OK)	220 pF @ 50 volts
C-7 Tantalum, (Lytic OK, add 1uF tant)	100 uF @ 20 volts
C-8 "	1 uF @ 35 volts
C-6/9/10/11 , ceramic,(disk OK)	0.1 uF @ 50 volts
Resistors,1/4W, carbon film, per schem.	I use new surplus
Potentiometer, baud rate.	25k ohms, audio taper.

Switches, jacks, enclosure etc to your taste. My DIP switches from RadioShack #275-1301. Relay typically, Hamlin HE421C0500, SIGMA 198TE1C1F-5S, CLARE 922A05C1C, GORDOS 831C-1. SASE for more information/discussion

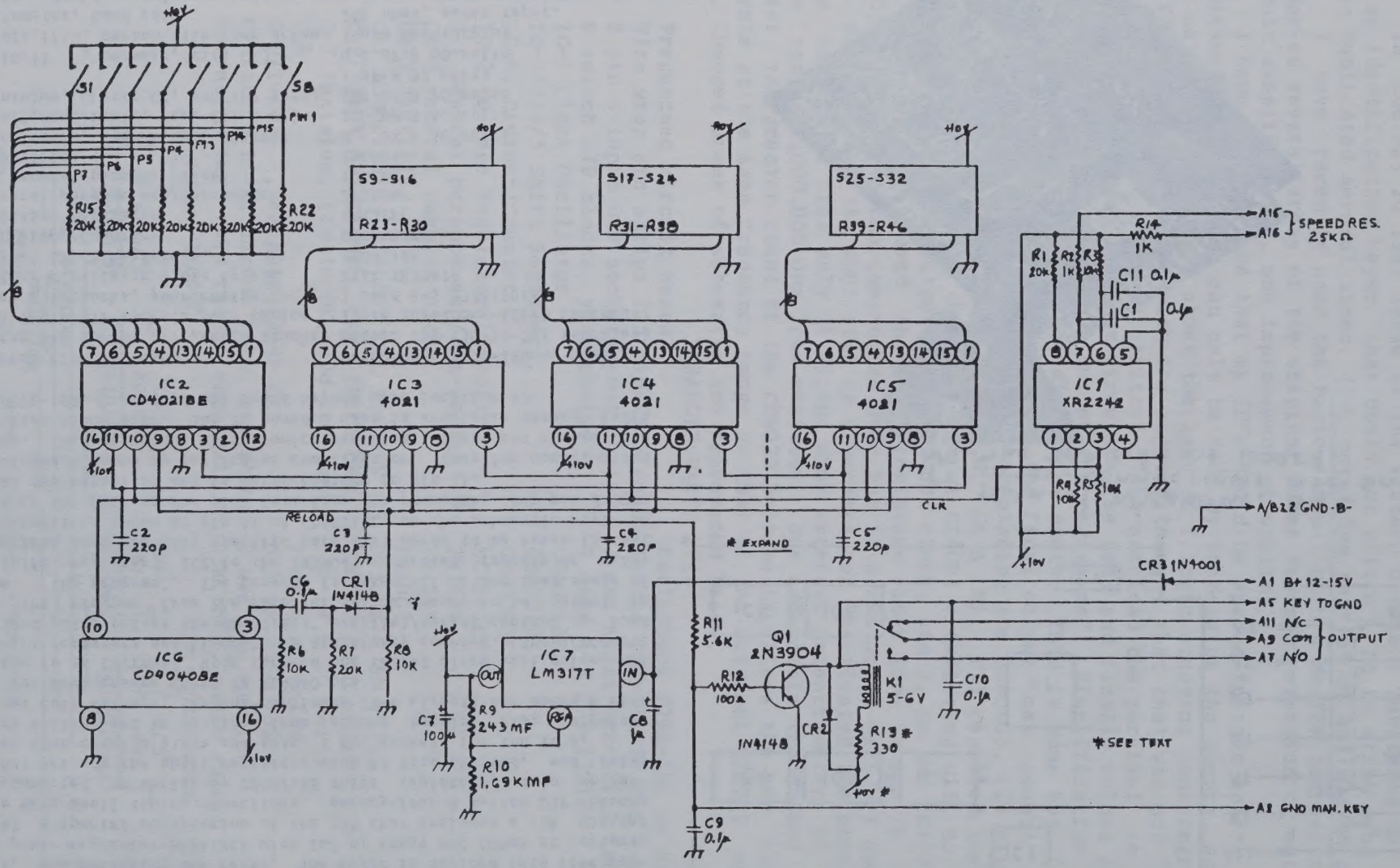
Herb Vanderbeek, WY6G, 630 Ashton Ave., Palo Alto, Ca., 94306



manual wirewrap. ALL inter-connections are on the TOP side of Board.



REPRINT OF ORIGINAL KEYER ARTICLE FROM WU#45



WU#68 page 6

SEA		
SCALE: N/A	APPROVED BY: WY6G	DRAWN BY N.B.V.
DATE: 3-20-87		REVISED
IDENTIFICATION KEYER		
H. VANDERBEEK		DRAWING NUMBER 171-9839-01

WESTERN UPDATE ACTIVE LIST as of October 28, 1989

Anderson	Brice	BA	W9PNE	PO Box 14	Lancaster	IL	62855	(618)299-2441
Armstrong	Lloyd			3813 Lancaster Drive	Pueblo	CO	81005-3065	
Babcock	David		WA6EBH	2940 Cheyenne Road	Riverside	CA	92506	
Bahr	Leland	LEE	W0VT	914 Golden Bear Lane	Kingwood	TX	77339-2914	(713)359-5284
Baker	Brad			21024 Bear Creek Road	Los Gatos	CA	95030	
Balfour	Herb	OHH	VE3OHH	91 Elgin Mills Road West	Richmond Hill (Canada)	ONT	L4C4M1	(416)884-5355
Barlow	Ron	A	N4GJV	Route 1, Box 297	Cleveland	NC	27013	
Bauer	Frank	FB	W6FPO	PO Box 1086	Felton	CA	95018	(408)335-7392
Bittner	Mike			27215 Sunnyridge Road	Palos Verdes	CA	90274	
Bond	Robert		WD6BCN	1420 McLoughlin Avenue	Oxnard	CA	93035	(805)985-0159
Borglum	James			5549 Lesa Road	La Mesa	CA	92041	(619)464-3250
Bowers	William			11542 South Kirkwood	Stafford	TX	77477	(713)530-4364
Bradley	Dave		W6CUB	PO Box 2043	Freedom	CA	95019-2043	
Bumpus	Carle			930 Idylberry Road	San Rafael	CA	94903	
Burhans	Ralph			161 Grosvenor Street	Athens	OH	45701	(614)593-8207
Buttschardt	Cliff	HDO, C	W6HDO	950 Pacific Street	Morro Bay	CA	93442-2327	(805)772-2132
Carter	Max	MAX		46 - 14th Street	Wheatland	WY	82201	(307)322-9439
Cathell	Frank	H, H2, D	K3YAZ	PO Box 535	Descanso	CA	92016	(619)445-8167
Chalmers	Doug			450 Adobe Place	Palo Alto	CA	94306	
Chaplin	Carl		W7Q0	Box 2800	Minden	NV	89423	
Chappell	Vernon			4511 - 36th Street #6	San Diego	CA	92116	
Coote	James	J	WB6AAM	808 North Ave. 66	Los Angeles	CA	90042	(213)258-7490
Cornell	Ken		W2IMB	225 Baltimore Avenue	Pt. Pleasant Beach	NJ	08742	
Costa	Bob		KB6QXM	P.O. Box 600	Redwood Estates	CA	95044	(408)353-3656
Cripe	David			7908 Wellesley Court	Pasadena	MD	21122	
Curry	David	PLI	WD4PLI	852 N. Lima Street	Burbank	CA	91505	(818)846-0617
Cutter	Robert	CO	KI0G	701 19th Street	Glenwood Springs	CO	81601	
DeVaughn	Bob	NBD	K3NBD	829 Estella Street	Pittsburgh	PA	15210	(412)488-1479
Dorman	Mike			15635 21st Ave. SW	Seattle	WA	98166	(206)246-3796
Egleston	Allan			20601 Resort Road	Sonora	CA	95370	(209)532-7111
Ericson	Jim	EK	KG6EK	226 Charles Street	Sunnyvale	CA	94086-6063	(408)773-8947
Farkas	Greg	AZ	AK7Y	PO Box 17074	Tucson	AZ	85731-7074	(602)749-4796
Farnsworth	Charles			506 Rutledge Drive	Lodi	CA	95240	
Faulkner	Charles	FPV	W6FPV	15844 McKeever	Granada Hills	CA	91344	(818)366-6210
Fisher	Montie		WA5TSL	808 Brett Drive	Edmond	OK	73013	
Forsman	Stan			1312 Burrows Road	Campbell	CA	95008	(408)374-2129
Fornek	Stan		K9IXC	640A Rance Road	Oswego	IL	60543	
Gelinas	Ed	T (dashes)	WA6AJY	557 N. Bayview	Sunnyvale	CA	94086	
Gosenca	Michael			203 Cherry St.	Eaton Rapids	MI	48827	
Grater	Jim			1136 S. Johnson St.	Lakewood	CO	80226-5113	
Hedspeth	Scott	N3S	WB4YZA	Route 4, Box 227	Mocksville	NC	27028	(704)284-4021
Helms	Bernard			4210-1 Walnut	Berrien Springs	MI	49103	
Herr	George			6690 Vista Del Mar #1	Playa Del Rey	CA	90293	
Holland	David	DCH	K3YAY	300 South Main Street	Berlin	MD	21811	
Hooper	William		KF6AR	366 S. El Monte Road	Los Altos	CA	94022	
Hoopes	John			1084-B Sergeants Drive	Robins AFB	GA	31098	
Horton	Bob	MSG	W6MSG	2 Fresno Street	Paso Robles	CA	93446	(805)238-2250
Johnson	Dave			PO Box 389	Gainesville	FL	32602	
Johnson	Dave	F		713 Texas Ave.	Los Banos	CA	93635	(209)826-0841
Johnson	David		WB7ACG	PO Box 15646	Rochester	NY	14615-0646	(716)235-1104
Johnson	Don	AU	W9TIF	3304 Roxford	Champaign	IL	61821	(217)398-4020
Jones	Ron		K7RJ	9241 S. Toni Lee Circle	West Jordan	UT	84088	(801)561-2685
Jones	Wallie	WJ	W6SZQ	9090 Nagle Ave.	Arleta	CA	91331	(818)892-0552
Kassel	Charles			114 Church Drive	Mastic Beach	NY	11951	
Keeley	Roy		KC4IMC	Route 3, Box 316 Salt Air Rd.	Theodore	AL	36582	(205)973-2516
Keller	Eb			2984 Fallwood Lane	San Jose	CA	95132	(408)263-6229
Kincaid	Nilan		W6EIG	5529 W. 140th Street	Hawthorne	CA	90250	(213)643-5269
Kraus	Howard		K2UD	372 Callodine Avenue	Amherst	NY	14226-2971	(716)838-2406
LaGrua	Michael			Box 549	Caspran	MI	49915-0549	
Layer	Hal		N6SPD	PO Box 27676	San Francisco	CA	94127	(415)661-6958
Lee	Mitchell	MEL	KB6FPW	172 North 24th Street	San Jose	CA	95116	(408)298-3026
Lehrbaum	Rick		AC1I	3275 Stockton Place	Palo Alto	CA	94303	

Leonardelli	John		VE3IPS	Box 722, Station A	Downsview (Canada)	ONT	M3M3A9	(416)636-3300
Lingwall	John			PO 70, 1025 Trinidad	Calhan	CO	80808	
Mallory	Mark	MPM, D, U	WB7CAK	5196 Cobblecreek Road #7K	Salt Lake City	UT	84117	
Manley	Dean		KH6B	2058 Ainaola Drive	Hilo	HI	96720-3638	(808)959-8257
Marshall	Dave			440 Larry Drive	Florissant	MO	63033	
Martin	Steve		NK3R	141 Bridgecreek Drive	Goose Creek	SC	29445	(803)797-3143
Mawhinney	Scott	T (dashes)		295 Pettis Avenue	Mountain View	CA	94041	(415)960-1041
Maxwell	James		W6CF	PO Box 473	Redwood Estates	CA	95044	(408)353-2094
McGreevy	Steve	SS, SA, TLX	N6NKS	unknown				
Mideke	Mike	Z2	WB6EER	Box 123	San Simeon	CA	93452	
Mussler	Mike			Bonanza Star Route	Nederland	CO	80466	
Nickerson	Rick	R	KB6JQU	3224 Saxonville Way	Sacramento	CA	95842	(916)348-1466
Norman	Charles			4938 Spirit Court	Stone Mountain	GA	30087	
Olson	Keith	7FS	W7FS	E. 15470 Highway 106	Belfair	WA	98528	(206)275-2560
Osterud	Jim			519 Capri Circle	Tooele	UT	84074	
Otacilio P. de Sousa	Jose`			Rua Calisto 62, Recanto dos Vinhais	Sao Luis, MA, Brasil, PR8BNP		65070	
Owens	James	Q	NW00	1363 Tipperary	Boulder	CO	80303	
Palermo	George			1444 First Street, Suite A	Sarasota	FL	34236	(813)365-7777
Paschal	Ev			Sinclair Island	Anacortes	WA	98221	
Pelmulder	Jim		N6PTM	2801 Gravenstein Highway	Sebastopol	CA	95472	
Pepe	Bill		WA2TDR	Box 1915	Bloomfield	NJ	07003	
Peterson	Art			851 31st Street	Richmond	CA	94804	(415)234-2014
Phillips	Ed	IZJ	W6IZJ	408 North Alabama Street	San Gabriel	CA	91775	(818)285-8308
Pomplun	Don		K2BIO	521 Van Buren Place	San Ramon	CA	94583	(415)829-7648
Post	Kendall			1842 Hoffman Street	Madison	WI	53704	(608)244-0500
Raney	David	UPN	WC8E	4128 Linden Avenue	Cincinnati	OH	45236	(513)791-0740
Rappold	Sam	ZYK	WB6ZYK	PO 1267/479 Briceland Road	Redway	CA	95560	
Ratzlaff	Steve	SR	AA7U	900 Henderson / 60A	Sunnyvale	CA	94086-9059	(408)248-0343
Raven	Gregory	TEXAS	KF5N	4550 Sunnybank Court	Fort Worth	TX	76137	(817)485-6771
Reid	Frank		W9MKV	Box 5283	Bloomington	IN	47407-5283	
Remington	Sheldon	HO	NI6E	PO Box 2094	Pahoa	HI	96778	(808)966-6946
Roberts	Todd	ABC	WD4NGG	PO Box 21413	Hilton Head Island	SC	29925	(803)681-8114
Schick	D.H.			580 N. Buena Vista Dr.	Lake Alfred	FL	33850	
Seabury	Tom			PO 535	Diablo	CO	94528	
Seamons	John	JKS	KF6VO	95 Holstein Road	San Anselmo	CA	94960	(415)456-6090
Seden	Randy	ELU, U	WD6ELU	1272 Harold Avenue	Simi Valley	CA	93065	(805)583-5687
Skillin	Boyd	B	K6MGX	3876 East Pico	Fresno	CA	93726	(209)222-0275
Smith	Glen		N6CX	220 Laurel, POB 475	Kenwood	CA	95452	
Smith	Randy			19515 Frederick Rd. #135	Germantown	MD	20874	
Snow	John		N6AMZ	3708 Judah Street	San Francisco	CA	94122-1227	
Spaulding	Fred		K1YQP	883 San Simeon Drive	Mountain View	CA	94043	(415)961-5018
Spencer	Chris	FAW	WB7FAW	722 West 1850th North	Orem	UT	84057	(801)225-7852
St. Angelo	Michael		N2MS	61-16 80th Avenue	Glendale	NY	11385	
Statom	Mike			1604 S. Campbell Avenue	Alhambra	CA	91803	(818)289-7170
Stewart	Don			2617 Anza Street	Bakersfield	CA	93305-3109	(805)871-7024
Stinson	Dave	R	AB5S/7	HCR 65, Box 71053	Pahrump	NV	89041	(702)727-4370
Sullivan	John			2069 Touraine Lane	Half Moon Bay	CA	94019	
Taylor	Al			112 Cook Road	Whitethorn	CA	95489	(707)986-7775
Taylor	Bill			327 Camino Del Campo	Redondo Beach	CA	90277	(714)378-5628
Thompson	Arliss	XU	W7XU	Route 1, Box 52	Colton	SD	57018	(605)446-3687
Tracy	John		WB7AMC	10431 Miller Ave.	Cupertino	CA	95014	(408)257-9585
Trinkaus	George			P.O. 532	Claremont	CA	91711	
Turner	Clint	CT	KA7OEI	145 West Street	Pleasant Gap	PA	16823	(814)359-2663
Vanderbeek	Herb	G4, V, 8-dits	WY6G	630 Ashton Avenue	Palo Alto	CA	94306	(415)493-1726
Vandermaaten	Jim	SM	WB6QZL	1276 Tourney Drive	San Jose	CA	95131	(408)258-6872
Waldsmith	Gary	SUK	K4SUK	1441 Hound Hollow Road	Pilot Hill	CA	95664	(916)933-3815
Weiss	Jim		W9ZMV	c/o Radio WTAQ	LaGrange	IL	60525	(312)579-9104
Welch	James		KK6N	3071 Mauricia Avenue	Santa Clara	CA	95051	
Wilson	Rex	TI	KB7TI	4550 Vernetti Lane	Kingman	AZ	86401	(602)757-3649
Wright	Rick	1SUN	KA5YWH	Box 4181, Station A, SEOSU	Durant	OK	74701	(405)924-3699
Wyatt	Frank		N6FW	855 Ticonderoga Drive	Sunnyvale	CA	94087	(408)737-8155